REMARKS

Prior to this Reply, Claims 1-100 were pending. Through this Reply, Claims 27, 29, 60, 83, 88 and 93 have been amended. Accordingly, Claims 1-100 remain at issue in the present case.

I. Claim Objections

The Examiner objected to Claims 83, 88 and 93 because the Examiner found it to be unclear as to how servo information is automatic gain control. Accordingly, the Examiner required appropriate correction.

Applicants have amended Claims 83, 88 and 93 to recite "automatic gain control information." Claim 60 has been similarly amended.

Therefore, Applicants believe that the objections have been overcome.

II. Claim Rejections

The Examiner rejected Claims 1, 4, 6-11, 14-20, 37-40, 43, 47-52, 61-63, 66-68, 71-73, 76, 77, 81, 82, 86, 87, 91 and 92 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,429,984 to Alex (hereinafter "Alex")[1] in view of U.S. Patent No. 6,633,442 to Quak et al. (hereinafter "Quak").

The Examiner also rejected Claims 3, 41, 42, 65, 70 and 75 under 35 U.S.C. § 103(a) as being unpatentable over Alex and Quak and further in view of U.S. Patent No. 6,091,559 to Emo et al. (hereinafter "Emo").

The Examiner also rejected Claims 83, 88 and 93 under 35 U.S.C. § 103(a) as being unpatentable over Alex and Quak and further in view of U.S. Patent No. 6,445,525 to Young (hereinafter "Young").

The Examiner also rejected Claims 84, 85, 89, 90, 94 and 95 under 35 U.S.C. § 103(a) as being unpatentable over Alex and Quak and further in view of U.S. Patent No. 6,347,016 to Ishida et al. (hereinafter "Ishida").

Quak is not prior art to the application. Quak claims priority from U.S. Provisional Application Serial No. 60/222,995 filed on August 4, 2000, whereas the application claims priority from U.S. Provisional Application Serial No. 60/223,444 filed on August 4, 2000. Thus, Quak was not filed before the application. See 35 U.S.C. § 102(e).

The Examiner asserts that "the Provisional application 60/223444 is clearly inadequate to support the claimed invention."

The denial of domestic priority is flawed for several reasons.

First, the Examiner has failed to indicate which requirement of section 112, first paragraph, the provisional does not meet. Section 112, first paragraph has three separate requirements: (1) the written description of the invention, (2) the manner and process of making and using the invention (enablement), and (3) the best mode contemplated by the inventor of carrying out the invention. Furthermore, the requirements are separate and distinct from each other (M.P.E.P. § 2161, Rev. 2, May 2004, page 2100-1643). Applicants should not be forced to guess to which requirement the Examiner is referring. Instead, the Examiner must provide a clear explanation (M.P.E.P. § 707.07(f), Rev. 2, May 2004, page 700-119).

Second, the Examiner has failed to indicate which claim limitation(s) is unsupported by the provisional under section 112, first paragraph. The Examiner has rejected 61 claims, including 11 independent claims. Applicants should not be forced to guess which claim limitation the Examiner is referring to. Instead, the Examiner must provide a clear explanation (M.P.E.P. § 707.07(f)).

---

[1] Applicants believe that any reference to Sacks et al. in the Office Action (see, e.g., page 2) is a typographical error.

Third, in the interests of expediting the case, Applicants shall assume *arguendo* that the Examiner's position is that Claim 1 is unsupported by the provisional under the written description requirement, and the same deficiency applies to the remaining claims.

The chart below sets forth Claim 1 in the left column, the provisional in the middle column, and comments in the right column. The provisional is reproduced with inserted page and line numbers in Exhibit A (attached).

Claim 1	Provisional	Comments
A method for providing an early warning of thermal decay, comprising:	The proposed thermal decay EARLY Warning procedure is based on the above stated physical principle. (Page 1, line 17).	The preamble is explicit.

Claim 1	Provisional	Comments
writing a test pattern to a track of a magnetic disk, wherein said test pattern has a higher data density than a data density of user data in said track;	Thermal decay is becoming an increasing concern to the stability of magnetic storage devices. (Page 1, line 3). In general, for a given magnetic material, the thermal decay rate increases with the increasing demagnetization field. (Page 1, line 10-11). This sector will thus have the lowest Mrt of the disk. (Page 2, lines 1-2). A pattern that decays faster than the signal the device uses for storage, hereafter referred to as Warning Pattern (WP). (Page 1, lines 17-18). [T]he WP pattern is recorded and stored in the drive . . . (Page 1, lines 37-38). [T]he decay of the WP is FASTER than any other pattern used in the device for conventional storage purpose, such as data pattern and servo pattern. (Page 1, lines 27-28). Choose a frequency (transition density) higher than the highest data pattern in the device. (Page 1, line 31). The WP will therefore decay considerably earlier than any pattern used for data and servo for this particular drive design. Hence, detecting the decay of the WP pattern offers early warning of the drive's thermal decay. (Page 1, lines 33-35).	The magnetic storage device is a disk drive that contains a magnetic disk. The warning pattern is written on the disk to indicate thermal decay in the disk. The warning pattern is written to a track on the disk, as is conventional if not inherent in disk drives and clear to those skilled in the art. The warning pattern has a higher transition density than any other pattern in the disk, such as data patterns and servo patterns. Thus, the warning pattern has a higher data density than user data on the track.

Claim 1	Provisional	Comments
measuring an amplitude of a signal produced by reading said test pattern;	Certain aspects of the Warning Pattern, such as amplitude, will be measured . . . (Page 1, lines 19-20). For example, VGA register value is when the head is reading the WP pattern is recorded and stored in the drive prior to factory exit . . . (Page 1, lines 37-38).	The disk drive reads the warning pattern and measures the amplitude of the warning pattern in the factory.
storing said measured amplitude;	Certain aspects of the Warning Pattern, such as amplitude, will be measured and stored for later reference. (Page 1, lines 19-20).	The disk drive stores the measured amplitude of the warning pattern in the factory for later reference.
reading said test pattern from said track to obtain an observed amplitude of a signal produced by said test pattern;	For example, VGA register value is when the head is reading the WP pattern is recorded and stored in the drive prior to factory exit and in the filed [sic, field], the same VGA register is read (defined by firmware) periodically. (Page 1, lines 37-39).	The disk drive reads the warning pattern in the field and observes the amplitude of the warning pattern.
comparing said measured amplitude to said observed amplitude; and	The reading results are compared to that of the factory stored value to determine the amount of thermal decay over time. (Page 1, lines 39-40).	The disk drive compares the measured amplitude of the warning pattern in the factory to the observed amplitude of the warning pattern in the field.
producing a thermal decay warning signal if said comparison is unfavorable	WP is more stressful thermal wise and the decay of this signal provides an early warning for the entire system. (Page 2, line 12).	The disk drive produces a thermal decay warning signal if the thermal decay is sufficient.

The M.P.E.P. discusses the written description requirement as follows:

> To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. (M.P.E.P. § 2163(I), Rev. 2, May 2004, page 2100-164.)
>
> An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. (M.P.E.P. § 2163(I), Rev. 2, May 2004, page 2100-165.)
>
> While there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure. (M.P.E.P. § 2163(I)(B), Rev. 2, May 2004, page 2100-167.)
>
> The Examiner, therefore, must have a reasonable basis to challenge the adequacy of the written description requirement. The examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims. (M.P.E.P. § 2163.04, Rev. 2, May 2004, page 2100-179.)

The provisional need only describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. Furthermore, the provisional can describe the claimed invention through express, implicit, or inherent disclosure. There is no *in haec verba* requirement.

The provisional describes Claim 1 in sufficient detail that one skilled in the art can reasonably conclude, indeed readily conclude, that the inventor had possession of the claimed subject matter.

The Examiner has the burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize that the provisional reasonably conveys the limitations. However, the Examiner has not even attempted to provide an explanation. Instead, the Examiner

merely asserts that "the Provisional application 60/223444 is clearly inadequate to support the claimed invention." Thus, the Examiner has no explanation whatsoever. Since the Examiner has failed to meet (over even attempt to meet) this burden, for this reason alone, the denial of domestic priority is improper. Moreover, the denial of domestic priority has no merit for the reasons discussed above.

If the Examiner persists with the denial of domestic priority, the Examiner is requested to clarify (1) the requirement under section 112, first paragraph, (2) the related claim limitation(s), and (3) any disagreement with arguments above.

Therefore, Applicants respectfully request that these rejections be withdrawn.

III. Other Amendments to Claims

The claims have been amended to improve clarity. No new matter has been added.

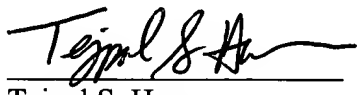
IV. Conclusion

It is believed the above comments establish patentability. Applicants do not necessarily accede to the assertions and statements in the Office Action, whether or not expressly addressed.

Applicants believe that the application appears to be in form for allowance. Accordingly, reconsideration and allowance thereof is respectfully requested.

The Examiner is invited to contact the undersigned at the below-listed telephone number regarding any matters relating to the present application.

Respectfully submitted,



Tejpal S. Hansra
Registration No. 38,172
Hansra Patent Services
4525 Glen Meadows Place
Bellingham, WA 98226
(360) 527-1400

Date: APRIL 21, 2006

Introduction

Thermal decay is becoming an increasing concern to the stability of magnetic storage devices. The phenomena are generally associated with the decay of amplitude of a recorded transition over time. The physics of the decay is governed by the ratio of the energy barrier for magnetization switching (KuV) to the thermal energy of the surrounding environment (kT).

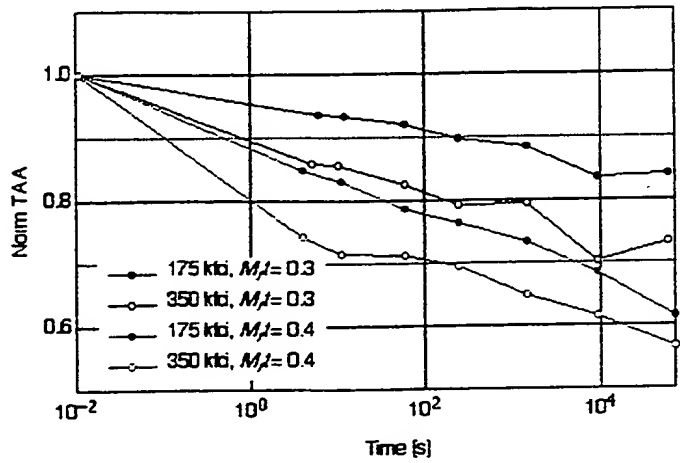
The energy barrier is a complicated function of the properties of the magnetic material and the magnetic field in the magnetic material. More specifically, properties such as anisotropy constant, grain size, demagnetization field and their distribution are the key factors in governing the thermal decay. In general, for a given magnetic material, the thermal decay rate increases with the increasing demagnetization field. The demag field is proportional to the magnetization of the material (Mrt). In addition, the demag field also increases with transition density, i.e., the closer the transitions are, the stronger the demag field in the transitions is.

Proposed monitoring of thermal decay in a storage device

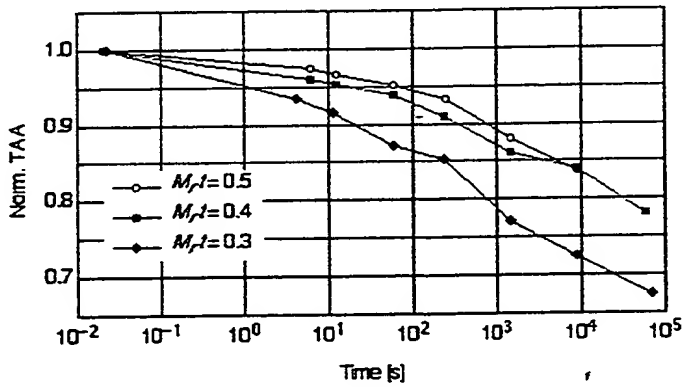
The proposed thermal decay EARLY Warning procedure is based on the above stated physical principle. A pattern that decays faster than the signal the device uses for storage, hereafter referred to as Warning Pattern (WP), will be utilized to provide the monitoring. The Warning Pattern will be written in prior to shipping out of factory. Certain aspects of the Warning Pattern, such as amplitude, will be measured and stored for later reference. The WP will be read periodically and the measured values of the reference parameters will be compared with the originally stored values. A threshold for the difference will be established by the design engineer and preset into the device to provide action control. If the change in the WP is larger than the predetermined threshold, pre-determined actions will be taken. Such actions may include data refresh, warning to users, etc.

The Key to EARLY Warning lies in the design and construction of the WP and the locations (in the storage media) of the WP. The principle in choosing these parameters is such that the decay of the WP is FASTER than any other pattern used in the device for conventional storage purpose, such as data pattern and servo pattern. Two possible suggestions for constructing the WP are listed below:

1) Choose a frequency (transition density) higher than the highest data pattern in the device. As an example, this can be achieved in a disk drive by writing a 1T frequency of an OD zone in an ID zone. The effective transition density will be much higher than the 1T pattern of that ID zone. The WP will therefore decay considerably earlier than any pattern used for data and servo for this particular drive design. Hence, detecting the decay of the WP pattern offers early warning of the drive's thermal decay. Alternatively, we can also use the internal diagnostic parameters associated with WP, such as VGA register value, as an indicator for the decay. For example, VGA register value is when the head is reading the WP pattern is recorded and stored in the drive prior to factory exit and in the filed, the same VGA register is read (defined by firmware) periodically. The reading results are compared to that of the factory stored value to determine the amount of thermal decay over time.



2) **Measure the servo AGC field for the ID zone. Pick a sector that follows the lowest amplitude. This sector will thus have the lowest Mrt of the disk. Write a 1T pattern on this sector only and use the 1T pattern on this sector as the WP. Since this sector has the lowest Mrt of the zone (can be around 10% lower than nominal), and this zone has the highest nominal transition density, the thermal decay of the WP will serve as EARLY warning for the entire surface.**



Numerous other approaches to establish a WP exist that serve the desired purpose, such as patterns with different 01 sequence, different frequency, PW50, resolution (defined in multiple ways) etc.

Key claims of the disclosure will be:

1) **Writing a specific pattern to serve as a thermal decay Warning Pattern**
2) **WP is more stressful thermal wise and the decay of this signal provides an early warning for the entire system.**
3) **Some easy ways of constructing the WP, as exemplified above.**

Warning of system level failure due to this mechanism BEFORE failure actually occur therefor allow recovery procedures to be invoked prior to any damage. The lead time of the warning signal can be adjusted by different construction of the Warning Pattern, as described in the body of the disclosure.